

Whither
Science
- pause & think

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PAUSE & THINK WHITHER SCIENCE ?



Centre of Science For Villages, Wardha

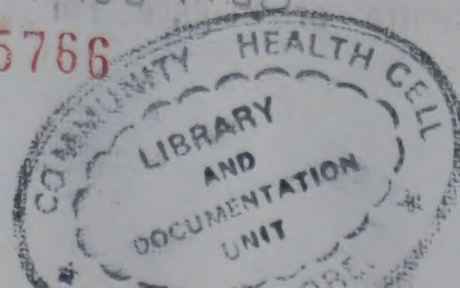
PAUSE & THINK

WHITHER SCIENCE?



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PREFACE

I met Joseph Cornellius Kumarappa for the first time in the Christmas vacations of 1945. He was the secretary and organiser of All India Village Industries Association (AIVIA), founded and presided by Mahatma Gandhi. I was a student in a technological institute at Kanpur and was in search of a field where my little knowledge of science and technology could serve some useful purpose and give me a fuller self-expression than I would otherwise have got in the industrial field. I had read Kumarappa's 'Public Finance & Our Poverty' his thesis of British economic management of India and various booklets published by A. I. V. I. A. When I introduced myself as a science student he told me that science today is serving the mamon. All knowledge is being put to the use of higher profitability by capital intensive centralised factory systems. This is creating disparities in the society, in the nature and peacelessness in man's own psychological make-up. He asked me to utilize scientific knowledge for an economic order in which the above three maladies are cured. The A. I. V. I. A. he told me, was an endeavour for just this purpose and I could come and work in its research lab, as soon as I complete my course. This I did, and came to Maganwadi in wardha, the headquarters of A. I. V. I. A. in May 1946.

From then on I got closer and closer to the thinking of Kumarappa, with whom I was associated till his demise in 1961, and was profusely impressed by the originality, long range vision and dynamism of his ideas. I noted in my diary then that as time will pass Kumarappa's ideas will become more and more valid and his articles and books which seem to be neglected today will be avidly sought and imbibed by the generations to come. Though after 38 years I still hold this view, I am yet waiting for the day when this will happen.

In the meantime E. F. Schumechar has distilled the Kumarappa philosophy for this age and presented many of its facets. The axioms which have a perennial message are to be presented in idiom the people of the time can understand. Here is a booklet of such of Kumarappa's articles on 'Science & Technology' interspersed by my own interpretative articles, as would be current and timely.

Devendra Kumar

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To the Scientists!

SCIENCE RUNS AMUCK

Early this month, the foundation stone of the National Chemical Laboratory was laid at Poona. We trust the scientists will turn their ingenuity to help the small man.

Village industries have been struggling on their own merits against an artificial current set up by the paddles of large-scale industries. In season and out of season, propaganda is carried on against the small producers. Real progress and the best utilization of natural resources are best achieved through village and cottage industries, and large-scale industries are wasteful though all scientific laboratories are focussed to help them.

We have previously drawn attention to the way the bullock ghanis (oil-press) and dairies are being crushed by financial interests pushing up oil-

mills for the production of 'Vanaspati' and how even the Central Government is helping on this programme by sanctioning new mills and shutting their eyes to the evils caused by mills and mill industries.

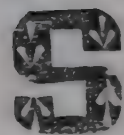
In spite of scientific evidence to prove the injurious effects of using polished rice on the health of the people, the rationing machinery has been used to distribute only polished rice regardless of the consequence to the people. Why could not our popular government follow the healthy lead given long ago by Travancore by banning all rice-mills?

Since last November the Central Government has been circularising all the Provincial Governments to discourage hand processed sugar. A scientific approach to this question will indicate that thousands of acres of the best lands can be



Economy of Peace

ECONOMY OF PEACE



Science and Technology have become the vehicles of commercial competition and that of war. We have to bring them back from war to peace. They can build and rejuvenate the countryside of India. Indian science is strong enough to fulfill this task. The challenges that it has to face today are that of an increasing population and diminishing employment.

The world population figures given below indicate how 1000 million (M) people have been added to it at a progressive rate from 100 to 30 to 15 years.:

1632	:	1000 M	1932	:	2000 M
1962	:	3000 M	1977	:	4000 M

This increase, unfortunately, takes place more among the deprived. A law seems to emerge that the birth-rate is checked as the standard of

living rises. Hence, if population crisis is to be met, disparity must be removed fast through increase in production and distributive justice working simultaneously.

We know that energy availability today largely determines the production and standard of living in a country. How to get this energy for all, from renewable resources is the question. The solar energy along with hydro-power may be the answer. India can get 50,000 M. W. electricity captured from the Himalayan streams alone. We have to take electricity to the smallest village. Only 14% of the Indian villages of less than 500 population are electrified and only 11% of these use it for power. The bio-gas, solar and micro-hydro electricity power grids will have to be tried to take power to the poor in a decentralized way (the way of 'energy alcoholics'* will not do).

Employment is the biggest problem, more so in rural agricultural sector. China has tried to solve it by allowing various units of production to have their own currency by giving labours-units which are interchangeable. These work-coins, in the hands of workers have done wonders. However this has been possible only under an autocratic and dictatorial system. The device can nevertheless be used in India under democratic rule. For this, a new education pattern will have to be evolved.

Our school population has increased from about 23 millions to nearly 90 millions in three decades and the total enrolment in higher education has increased from about 0.4 million to more than 3 millions in two decades. The largest increase is at the undergraduate stage where average annual rate of growth being 13.3 per cent against 11.1 percent at the postgraduate and research stages. Majority of student enrolment is from urban areas. One out of 11 students in college and universities is from rural areas. In 1950-51, percentage of institutions teaching in Agriculture and Veterinary Science was 3.9. In 1970-71, it had fallen to 2.1. This unequal growth rate of the institutions of higher learning has created a serious problem in the field of employment.

Total estimated population of India is about 620 M out of which two thirds live in villages and our net working population is of the order of 620 M. in the organised sector (including private and public), about 19 million persons are employed and in the unorganised sector, specially in the rural areas, 130 millions are involved in agriculture and allied occupations. At the present moment, about 60 M are underemployed. They need secondary employment to augment growth rate. It will not be possible to create more than 1 million jobs each year. Therefore, the only alternative to increase the employment potentialities will be to activate the agricultural sector and also to set up agro-based and other small and medium scale industries in rural areas. Science and technology can play a pivotal role here in revitalising rural economy.

We are sure, as Nobel Peace Laureate Lord Phillip Noel Baker said in the international seminar on 'Strategies for Rural Development' at New Delhi on 29th Jan. that, 'India can be in the forefront of this campaign of peace and rid the world of war, terrorism, kidnapping, Mafias, criminal gangs apartheid. All these forms of violence can disappear if the villages have a happy future. India can give a lead to the world as no other country can.'

—Devendra Kumar

NON-VIOLENT ECONOMY AND WORLD PEACE

How, in the present context of the world, can we obtain security and peace? On all sides we are faced with insecurity-personal, political, economic and social. This has brought about terrible conflict among the nations. As my space is limited, I shall confine myself to the outlining of the economic causes of insecurity and its remedy.

Paper agreements and appeals have little effect in bringing about lasting peace. The seed of war and international tension lies largely in the field of economics. So if we want to deal effectively with war, we must study the present day methods of production, distribution and consumption. War is the end-result of the friction generated in the daily life of everyone of us, and is not the result of the evil doings of one or two outstanding world figures. If anything, such world

figures are but the victims of our greed to benefit from the weak position of our neighbours.

By nature, our countries are blessed with resources, which, if we handle in a proper and rational way, shall generate peaceful living for all of us. It is the attempt of the more powerful to turn conditions in their own favour, that brings nations into conflict and turns our neighbours into enemies.

Resources

The least that each nation can do is to aim at being able to provide its people with food, clothing and shelter. After that, if any resources of land, water and minerals are available, we may enter into trade and commerce by attempting to supply the demands of luxury and enter into foreign exchange of goods. Any maladjustments and misdirections lead us into trouble.

For instance, Indo-China produces nearly 85% of the world's supply of rubber. But it cannot, by any stretch of imagination, use all this production. Most of the highly developed and industrial countries need such raw materials. How can they get at this basic need? Only by controlling the direction and production of this material. To do this, the foreigners attempt to get hold of the country. This is the basis of all colonialism. The people of Indo-China, instead of producing so much rubber, should lay stress on the production of the materials for their own food, clothing and promote primarily industries conducive to such an economy. Only such direction of their economic life will bring contentment for the large masses of their people.

Similarly, Ceylon produces chiefly tea and rubber. What can be done with such an economy? Ceylon is an island. It can be easily controlled by a naval power and made to surrender its economic life to the needs of the foreign manufacturers as it imports all its requirements of cotton yarn and most of its food. Whatever wealth is made by its trade remains mainly in the hands of the exporters and importers and leaves the country in insecurity as people could not eat the rubber or clothe themselves in tea-leaves if the island were surrounded by interested parties. Hence their safety lies in moulding their economic life to suit their national requirements.

Treasures in an open house tempt the passerby. If we do not wish robbers to visit our houses, we must keep our doors closed. Our natural

resources are our patrimony. Manchuria has a wealth of coal. It was this attraction that made Japan conquer Manchuria. We should plan our needs and not trade on it. When our hidden treasures get exhausted, it leads to violence. As far as possible, we must live within our own resources and conserve them for our future generations. It is the extravagant use and exploitation of petrol that is driving America to seek violently other fields in Trans-Jordan, Iran and Borneo. That has made her a belligerent nation. For this, we need long term planning.

Employment

Every raw material presents opportunities of employment. The export of raw materials, therefore, deprives the locality producing the raw material of the possible employment. For this reason, as a rule, the people of the locality must work on the raw materials available and should be paid adequately. Then, there will be no "underdeveloped" countries, for every country will engage itself in producing all the goods it needs that can be made out of its own raw materials, and exchange its surplus for other articles it cannot otherwise obtain.

Method of Production

Thus far we have seen how to utilize our resources. Now we must consider how we should proceed to convert our raw materials into consumer goods, especially in under-developed countries. Most of the countries of Asia are under-developed. They all represent an enormous labour power

which is largely unused or under-employed. This indicates that as far as possible, we should avail ourselves of this power. In the first instance, at least this does not call for "labour saving" devices, but methods of production involving increased labour forces. In this way, we shall be able to bring satisfaction to everyone of this neglected section of people.

Wages

The amount of returns to be paid to our workers must be based on what is needed to maintain him or her on a full diet and on a reasonable and suitable standard of living. At present, in capitalist countries especially, the price of commodities controls wages. Wages are largely an elastic factor; the higher the market price and profit, the better will be the wages. It should not be so at the basic wage level. The elastic element is in the nature of a profit and so should not be brought into the equation at the wage level. Basically workers should be paid what is needed to maintain them throughout the year.

In India, our landless labour has work mostly during the monsoon or rainy seasons and then live at a very low starvation level. They should be paid enough to maintain them throughout the year on a reasonable standard. This will immediately put up the prices of agricultural products, which will lead to a better distribution of wealth and satisfaction.

Dissatisfaction is one of the fertile seeds of conflict.

Cost to The Producer

In the so called "under-developed" countries, the producer of primary products rarely gets a square deal. Every producer is entitled to have his upkeep, included in the price of the finished product. If anything less is recovered for the producer from the consumer's price, there results violence through exploitation. This, if multiplied, results in dissatisfaction and wars.

In our country, the landless labourers are starving because the prices of raw materials do not provide for their adequate maintenance. If they did, the prices would rise. Are we, as consumers, prepared to pay honestly for what we get?

Prices, to be fair, should be regulated by the producers and others concerned. For this purpose, at present, there is no adequate organization, with the consequence that what is due to the primary producer who is the weakest number on the line, is cut down to a minimum.

Place of Agriculture :

Agriculture should not be treated as an industry and should not exist on the price mechanism. We all know the scandals caused by burning a good harvest of wheat, to raise the prices, by reducing the stock. Such acts must be regarded as utterly anti-social and dealt with accordingly.

In certain quarters in the West, there is much appreciation of the Bhoodan Movement but the spirit of it remains untranslated into action as they have not yet found the counterpart of it in industrialised countries. They express their sympathy but have no land to donate. A programme like

Bhoo dan need not be copied in all its entirety. What is essential is to give vent to the spirit of sharing.

In the West, machinery for sharing exists but it is brought into play from the wrong end and so has resulted in exploitation and violence. What is wanted is to adapt this machinery for sharing in such a way that it will generate non-violence.

This machinery for sharing, as developed in the West has three parts. The first is the price mechanism, the second labour unions and the third, propaganda, advertisement and high pressure salesmanship. All these are now used to exploit and extract an undue share of material wealth for oneself. If this same machinery is put on the reverse gear, it can be used for sharing so as to promote non-violence and social harmony.

Price Mechanism

Middlemen fix prices with a view to increase customers. By a larger turnover and a low price, they hope to increase their own gains. Consequently, they cut down the share of the price that should go to the primary producer and leave him with hardly enough to support himself. In price fixing, the producer of the raw materials should have a voice. His share should be calculated on the basis of what he requires to maintain himself and his family all through the year on a reasonable standard of living. A great many primary producers, like the landless in India, are starving. Such a situation cannot be tolerated in an equalitarian society and if left unremedied for a long time will end in violence.

If the price includes enough for the raw material producer and if this extra has to be paid by the consumer, such price is bound to be high. So there will be fewer consumers involving a loss to middlemen. Consequently, giving a due share to the raw material producer will entail a sacrifice on the part of both middlemen and consumers. This is sharing that has to be accomplished through the price mechanism. At present, the less industrialised and under-developed countries are left at the mercy of highly industrialised countries and are being impoverished steadily. This situation also calls for justice and fair-play. Will the industrialised countries be prepared to part with their ill-gotten share?

Labour Unions

The function performed by labour unions to extract an increased share for labour, by collective bargaining, by organizing strikes etc. is somewhat suicidal and is largely based on force and coercion. Such sharing should be brought about through voluntary means by mutual understanding and negotiation. Will the employers be reasonable enough to mete out justice and reduce their own share of profits?

Propaganda, Advertisement and Salesmanship

At present, various dubious methods are used in telling half-truths and white lies to dupe the public by advertising goods to be what they are not. Unwary customers are thus made to part with their purchasing power for unneeded goods or

even for unwanted articles. Honesty has to be introduced in the place of high pressure salesmanship and enslaving devices, like the part payment system, should be abandoned if customers are to live within their means. This calls for vigilance and proper education of the public and national workers.

Dissemination of Information As to Cost

Today the consumer does not know what constituent items he is paying for in the price. He knows of 'fixed' price. This he pays and fully believes that he has discharged his duty honestly. If only the consumer knows that the price he is paying is not fair but is too low to give an adequate return to the producer, he himself will probably not be at peace. It is therefore our duty to make available to all concerned, full information as to the spread of the cost of an article.

If, for example, the smoker know that the tobacco he smokes is produced under conditions which lead to the starvation of other people, his conscience will not allow him to patronise that brand of tobacco. We must bring this moral force into play in the economic sector.

To work out this programme, we have to educate buyers, middlemen and the producers; we should organize the movement of goods rationally, and set up a strong machinery for the fixing of prices. Before undertaking all this, we ourselves should be willing to make the necessary sacrifices.

If we can organise the primary producer and the consumer by disseminating correct information regarding articles put out for sale, it will go a long way in introducing, even in highly industrialized places, the spirit of Bhoodan, the spirit, namely, of sharing equitably the gains of industry. To serve in this way, we need character and courage. This work is bound to create opposition from vested interests at least in the beginning. Are we ready to face the situation and abide by the consequences in the interests of a great cause?

By these means we shall be filling up also the gap that exists in wealth and opportunities between the so called industrialized and the under-developed countries. Such a course will remove discontent and ease the tensions which are the fruitful causes of war. It is only such fundamental reorganization of our economic order that can bring in lasting peace. We cannot afford to lose time and effort on makeshift arrangements that will break down at the first approach of any stress or strain on the various component parties. This way is worth pursuing if we desire permanent peace. Are we prepared to pay the price?

Markets

The goods we manufacture must have a ready and local market. Wars are caused by attempts to control markets. It was such competition that drove the United Kingdom, Germany and Japan into devastating wars. The under-developed countries supply raw materials to and consume finished

products from the industrialized countries. This creates fertile beds for colonies. Every country should be allowed to develop in its own way without any hindrance from outsiders. Foreign interference suppresses independence and leads to violence.

International Trade in Surpluses Only

When goods are produced, they should first be available to the producing country and only the surplus left over should be free for export to other countries.

Discriminating Consumption

If collectively we are not able to bring about such non-interference, the citizens of under-developed countries should be so educated as to develop into discriminating buyers.

They should not buy foreign articles where locally manufactured goods are available. This is a difficult policy to practise of the temptation of cheap prices and perhaps better goods being available from elsewhere. But such a development of character is absolutely essential for the production of peaceful conditions. We have to draw ourselves into our national shell for protection, when the danger of exploitation presents itself. This is the "Swadeshi" of non-violence.

Without studying this question minutely, many persons are carried away by the talk of

'World Markets'. Today such a talk is doped out by the capitalist. The Soviet Union has set an example in these matters by making foreign trade a state monopoly and by keeping foreign traders from entering the inside local market. These measures ensure better wages and living conditions to workers.

I have, in passing, cited these illustrations to bring out in relief the deep set causes of present day colonialism which give rise to the cause of war in the economic field. At present, we witness the strange phenomenon of science and human effort struggling to produce more and more goods and yet in most countries, the results of all this effort do not seem to raise the people from poverty, starvation and distress. Of late, even human life is made very insecure and such existence as we can expect is made of worry and care. The modern weapons of mass destruction cause nightmares throughout all the countries of the world. The present day methods of warfare need little to condemn them. Apart from the general, moral and social considerations, the economic consequences are forbidding. The war brought about by imperialism destroys more than the good it brings to its few beneficiaries. The masses of people have nothing but destruction to gain by the transaction; not only material destruction but what is worse is the human demoralization and destruction. This one issue is in itself enough to condemn them.

Conclusion

Hence, we see a great deal of our effort to obtain freedom from world tension lies in recasting our economic organisation. (1) The raw material producer must be given sufficient to maintain himself on a reasonable standard of living; (2) Prices must be fixed with such as the base, and the raw material producer must have a voice in fixing the prices of his produce; (3) Raw materials must be converted into consumer goods where the raw materials are produced, thus providing further opportunities of employment for the people of the locality; (4) The consumer must be educated to realize his duties towards the producer, and for this purpose, he should be supplied authentic information about the component parts of the price of articles; and (5) Most international trade must be in surpluses.

Economic security and fair play is the foundation of goodwill. They alone will dispel suspicion, hatred and jealousy which disturb the peace of the world. Therefore, to bring about world peace we have to find ways and means of liquidating the so called "under-developed countries" and be prepared to share the good things of the world equitably. This will make a big call on the industrialized countries. Are they prepared to make this sacrifice? If not, all our efforts towards peace will be short-lived.

These points I have raised are only to urge that the Government of each country should follow the way which meets the needs of its common population with an eye to their comfort and well-being rather than from considerations of material accumulation of wealth. Until we shift our view point to meet the requirements of the people and reorganize our economy to produce commodities needed by the masses of the people by our own efforts, leaving international trade as a residuary benefit, we shall not be able to bring about world peace. We have to rationally organize each of our countries for peace. Mere paper agreements with imperialist governments, however well-meant, will not lead to a stable peace. Real and lasting peace can only be obtained when we are organized for it and it be the outcome of our action. Today war is definitely the result of our economic actions; similarly by a change of approach, we can and we must live for permanent peace. This needs a great determination and much courage to accomplish. If all under-developed countries realise this and stand as one man, peace cannot be far off. May we all unite in this common purpose and live and die for the peace of the world !

— J. C. Kumarappa



Which Way Technology?

GANDHIAN THOUGHT AND MODERN TECHNOLOGY RELEVANCE

Technology and economics are inter-related. The kind of technique influences both the economic pattern as well as the cultural matrix. Artisans and small craftsmen with decentralised method of production and local consumption for self-sufficiency was originally the norm. Gradually the advent of inanimate power as motivating means of production, brought about change in the technology and consequent change in the economic order. The wind-mill and water mill belonged to to inexhaustible and comparatively universally available inanimate sources of energy. The manual and animal drought power still reigned supreme. But with the use of coal through steam power

to generate motive force for production brought about the beginning of the industrial age. The concentration of production units started in spots where such energy was easily available. The changing pattern of economics towards mass production in place of production by masses held its sway. The conglomeration of human population to the industrial town along with decay of the village economy and "the deserted village" began with the rise of the megalapolis. The change, from manufacture for a small area of consumption to a larger and larger area of marketing even in goods of primary needs was proliferated. The birth of industrial empire, and political and military support for the same brought the age of imperialism. As a result, we saw the clash of competitions

leading to two Great Wars, for capture of markets of finished goods and sources of the raw material—mainly the mineral resources of the world.

Progressive depletion of the natural resources leading to a realisation of the limit of non-renewable resources., the labour-employer difficulties in the highly mechanised and centralised system of production, the ecological imbalances and problems of pollution, the monotony of existence and lack of means of expression to those in production lines and psychological strains on the atomised individual, these and many other crises face today's man. These conflicts are (a) between the interest of man and that of society & the nature, (b) between the needs of man, the individual and that of society— the collective, and (c) between man's material satiation and his spiritual needs. These problems are the creation of harnessing of technology for the fulfilment of man's avarice and his insatiable lust for power. Now however, a critical stage seems to have arrived and a revolt has set in the human mind against this traditional role of technology being used for profit, power and plunder.

The post-war era, over and above the other crises, began with the threat of a nuclear holocaust. It has now become necessary to search for an alternative technology whereby the above maladies which tend to increase the quantum of conflict and violence in the total system could be remedied. Hence, man is now finding that the

principles enunciated by Gandhi in this regard have begun to find greater and greater relevance. These principles of Gandhian economics of peace and non-violence are :

1) **Self-Sufficiency**

The greater the magnitude and intensity of a particular need, the more easily should its fulfilment be obtainable in space and time i. e. the degree of self-sufficiency in a particular commodity should be determined by its degree of necessity. The lesser the degree of requirement of an article, the greater could be the area from which it be fulfilled and vice-versa.

2. **Decentralization**

The economic, political, social or any other human system must be as decentralized as possible to give freedom to the components to evolve themselves in diverse forms and be able to interact to enable greater evolution and efficiency.

3) **Villagization**

The village being a form of habitat for man which affords him the closest communion with such decentralised units of living be preserved, promoted and evolved in the light of the newer knowledge or science. The city makes both the distances between man and man, also between man and nature, greater.

4) **Motive Power**

The motive power for production be in the order, respectively of manual, animal and perennial sources like wind, water, solar etc

and only in extreme necessity, the non-renewable resources like coal and petrol etc. be used.

5) The Fulfilment of Human Needs

The productivity of Nature be balanced with and as a bee's requirements are met in a way that helps nature to prosper rather than be destroyed by it, so also should be the human consumption techniques. The mineral resources are trusts given to us, also for the generations yet to come and so should be utilised with that attitude of mind.

6) Distributive Justice

The production and distribution pattern be such as to avoid concentration of wealth. To remove disparity, the mode of first allowing the wealth to be produced at one place and then to make the distributive justice prevail, requires power of the state to be concentrated. In its place, the production system itself be decentralised as to have an in built mechanism of equitable distribution of wealth.

7. Wiping Out Disparity

Traditional trend of technology which has helped to increase production in a geometric progression by assisting the strong to become stronger has created a great economic gap between the affluent and the third world countries. This trend must be reversed to strengthen the weakest link in the economic chain. Thus, alternative technology has to be found out by the most sophisticated scientific

people for the poor of the world and evolving processes which will preferentially assist them than the rich.

8. From Passivity To Activity

The mode of production be such as to give freedom of expression to the individuals engaged in it. Instead of the machine being man's master, he should be the master of the machine. It is the expression in creativity in various fields which makes man's life worth living. Instead if his passive role predominates both in productive as well as in consumer and in all other fields, degeneration sets in. To reverse this order, new techniques have to emerge.

9) Balanced Inter-dependence

Inter-dependence is a law of life, but when this interdependence is not balanced and A is more dependent on B than B on A, B will tend to exploit A. Hence, the mutual dependence of A and B should be made balanced. This will remove imbalances wherever they exist. Even with the best of intentions, regional imbalances and interpersonal imbalances take place, which need to be removed.

10) Labour intensive Techniques

The techniques be labour-intensive rather than capital-intensive so that they can be in the ownership of the producers themselves who can then have the capability to pay back the capital locked, at their earliest. This type of units will have a higher Replicability Quotient among the poor sections of the

community and provide benefit of carrying to larger number. This intensity, by way of labour employment will vary from industry to industry. In more recurring and materially consumed commodities, more labour-intensive techniques will be needed.

In these ten principles of Gandhian economics which determine the direction of the technology, we can see how the orientation of science towards the spiritual needs of man can be met. Vinoba Bhave has rightly summed this up in his Mantram 'Sarvodaya' = Science + Spirituality, meaning unless the power of

sciences is given the direction of spirituality, Sarvodaya i. e. total welfare of all will not be possible to be achieved. Science, therefore, must be given a new orientation from the current direction of using the environment for the narrow self-interests without due regard to all the dimensions of space, time and spirit. This is the new orientation for which Gandhi stands. Let us see how, we in India, can help the world in realising the balance which it has miserably missed.

—Devendra Kumar

"I claim that I am not an enemy of higher education. But I am an enemy of higher education as it is given in this country. Under my scheme, there will be more and better libraries, more and better laboratories, more and better research institutes. Under it, we should have an army of chemists, engineers and other experts who will be real servants of the nation, and would answer the varied and growing requirements of people who are becoming increasingly conscious of their rights and wants. And all these experts will speak, not a foreign language, but the language of the people. There will be truly original work instead of mere imitation."

—Gandhiji (9-7-38)

WHAT IS SCIENCE ?

Science is not the creation of man. Nature works in well-defined grooves according to immutable laws. When man understands these laws and reduces them to a system of knowledge, we call it science. It follows, therefore, that any course of action to be termed scientific should conform to nature in all its bearings and where we deviate from nature, to that extent we are unscientific. Man may understand vaguely the lines on which nature works, and makes use of that partial knowledge for his own purpose, deviating by so doing from the course ordained by nature. Such deviation will lead ultimately to his own destruction, because he himself is a product of nature. Destruction so caused may be at his own hands or through malapplication of partial understanding.

Progress

Progress signifies both the search after knowledge and truth as found in nature and its application to satisfy needs. In the measure in which we are able to pull alongside nature's dictates, we shall be progressing in the right direction. But in so far as we are pulling against the course of nature, we shall be creating violence and destruction which may take the form of social conflicts, personal ill-health and the spread of anti-social feelings, such as hatred, suspicion and fear. From these symptoms, we shall know whether we are progressing scientifically or not. If our course of action leads to goodwill, peace and contentment, we shall be on the side of progress, however little the material attainment may be, and if it ends in dissatisfaction and conflict, we shall be retrogressing, however much in abundance we may possess material things.

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Economic Activity

The activity of man to satisfy his elementary needs must, therefore, not merely produce the material goods but should be conducive towards the growth and development of his own personality. When a man eats food, it does not only satisfy his palate, but replenishes the waste products of his body, maintains it in good condition and allows for growth and further development. If the food that he ate only satisfied the palate without contributing to the two other aspects of his needs, it will be of no use. If a person drank water sweetened by a saccharin, however much he may like the sweet taste, he cannot enjoy good health and strength as all the elements necessary for his body-building, maintenance, replacement of wastage are not present in proper proportions. Taste is a good thing but it is not all. The main function that food plays is performed after it has left our palate. It is the manner in which the food gets assimilated in the body that is going to tell ultimately. Similarly, work also must not be judged by its outward appearance nor by the quantity of things produced. Work should develop the human personality and be as food to all the human faculties. When we through greed or false notions or a wrong sense of proportion, interfere with nature, hoping to obtain short-cuts, we generally end up by being wasteful. Nature does not believe in short-cuts. The mills of god grind slowly. Hence in our hurry, we often bring destruction on our heads and we imagine such quick results to be a sign of progress.

Food

For instance, nature packs up all nutritious articles, e. g. foodgrains, fruits, eggs etc. carefully in such a way that the ingredients are kept intact and in proper proportion as will be necessary for the users. But when we destroy nature's packing, we create counter influences which also destroy the value of food.

Rice, to cite one example, is packed up well in the husk coated with bran and equipped with pericarp and the grain. When this is to be eaten, all that we have to do is to dehusk the rice. Such dehusked rice, because of its nutritive nature, will be attacked by weevils, vermins, rats etc. Therefore, when we require rice, we should dehusk what is needed at the moment and keep the rest as paddy. Then alone we get the whole benefit from eating the cereal. But man, in his hurry, uses a rice mill and as he cannot store rice when dehusked, he proceeds to polish it and takes away all its nutritious elements. By so doing, he no doubt increases the storage properties of rice, but at the cost of its food value. This is an instance in which human interference with nature is thoroughly unscientific and however skillfully the mechanism may have been devised, it is unscientific in the true sense.

Husbanding of Resources

A Scientific use of resources should mean that we get the fullest benefit out of what we find around us. Man in his eagerness to use mechanical devices is often irrational in the utilization of resources. For instance, if paper is to be made

out of bamboo by the simple hand process, we do not use bamboos cut fresh from the forest. The bamboos in the forest, when they are first cut, are used in various ways for roofing, for being made into mats, sieves, baskets and other household articles and then, when they have served their term as such, the broken and used-up bamboo pieces are converted into pulp and paper is made from it.

But the so-called scientific industrialist cannot afford to work on this basis as his machines are to be kept going all the time, so in his hurry he has to get the tender bamboos from the forest and feed them into his mills to be converted into paper. For this purpose, he has to cultivate forests of bamboos, directing human energy into lines which were totally unnecessary in the former case. Hence, the mill process of making paper, as we have shown, is thoroughly unscientific and wasteful in the utilization of natural resources.

Similarly, if we have to utilize as food the nutritious elements found in nature, we may get 'gur' from palm trees that grow wild on uncultivable lands and obtain the whole benefit of the sap, minus the water which it contains, along with sugar in a digestible form, and various minerals and salts.

But, man in his anxiety to use his knowledge puts up sugar mills, converts good lands which may be used for cultivation of cereals into sugar-cane growing lands and then the sugar-

cane is converted into sugar, wasting bulk of the minerals and salts in the molasses which are thrown out as unfit for human consumption and from which he prepares rum and gin to poison the people and to acquire for himself the money they possess.

Even if sugar be required to be produced by hand, the 'rab' prepared from palm juice can be centrifuged, and having obtained the sugar, the molasses left can now be converted into edible gur rich in minerals and salts. Molasses produced from the sugar mills, as they are affected by the use of sulphur compounds in the processes, are not fit for human consumption and have to be wasted or converted into intoxicating drinks as stated above.

Here again, we see that sugar mills are thoroughly unscientific and wasteful of human resources. They, like the rice mills, are only to satisfy the greed for accumulation of wealth by individuals at the cost of nutritious food products found in nature.

Utilization of Resources

In our quest for ways and means of satisfying our needs, we have to take into consideration the resources available to us and make the best possible use of them. It will be unscientific to use coal for fuel where it is not available and where crude oil can be easily obtained. Similarly, where coal is available and where no firewood is available, it would be senseless to bring firewood from distant

places for purposes of fuel. In the same manner, where human energy is available cheaply and in abundance, it will be irrational to obtain other motive forces from distant places. In India, where people are suffering from unemployment and lack of occupation. To produce our needs to resort to mill production, which ultimately spreads unemployment, is unthinkable. From this point of view, hand spinning, however slow it may be, is scientific and in line with human progress while textile mills are irrational and spell ruin to the people.

Perversion of Taste

Through propaganda, people's natural taste is perverted. They are made to believe smell and colour are to be avoided. They may be taught soon to hold that paper roses are better than natural ones as the latter do not "stink". The best example of this type of perversion for business purposes is the present drive to popularize vanaspathi ghee. Here the mill prostitutes scientific knowledge to deodorize and decolourize the natural oil, to substitute nutritionally inferior oils for the traditionally used ones, to solidify vegetable oil while lowering or destroying their digestibility. They render all this disservice at an enhanced price. Is this not taking liberties with nature, science and progress? Do we not deserve it, if in return, nature visits us with blindness, loss of powers of growth and reproduction? This is industrialization in all its nakedness. Such is what passes for science and progress today

heralding their advent by highly paid advertisements, exploiting the ignorance of the people.

Machines And Tools

This does not mean that there is no room for machines. Where standardization and regimentation of labour are called for, the use of large scale machines is indicated. Where precision tools are to be made and standardized, articles are essential, then production of these through machines will be necessary. But in consumption goods, duplication and standardization are not of the very essence of their being. A comb may be made of horn by hand; but no two combs so made will be precisely alike. There is no purpose in standardizing such articles. Hence making combs from plastics is not called for. Similarly, there are many articles in common use which do not call for standardization. On the other hand, most consumption goods call for the catering of individual need and taste. In such cases, only cottage and village industries can answer the purpose. When a man has to be fitted with a pair of shoes, the shoes have to be made for his feet, even so as to conform to any deformities that he may possess. Such making of shoes for a particular person's feet is scientific and will help the shoe-maker to use his resourcefulness and ingenuity to meet the need and thus help him to develop his capacity; while standardized shoes though they may produce the articles in abundance, cannot be said to be thoroughly scientific in so far as they are not calculated to fit any particular foot exactly. So large-scale production of shoes

as compared with the work of the mochi is again unscientific and so against progress.

Violence and Destruction

In the last two generations, we have known the result of mechanical production of standardized goods. The raw materials are needed in large quantities and they have to be collected from the four corners of the world and the finished products have to be assured of a definite market and for these the ocean routes have to be kept clear and safe. These conditions have brought about the two catastrophic global wars. In the course of these wars much of the the human production and skill has gone into destruction. Any war is definitely against progress; it turns men back to the jungle and so can be termed unscientific. Since our activities to satisfy our human needs have culminated in these global wars, they are unscientific and retrogressive.

Conclusion

Therefore, when we attempt to plan production in our country to satisfy our needs, we have to be careful to choose the most scientific method and the most progressive ways. We must remember that production of a multiplicity of goods is not synonymous with progress, nor is destruction a sign of science. Attainment of quick results are not conducive to the production of culture. Nature

works in mysterious ways and demands its own time. No Man in a hurry can be either progressive or scientific. We need patience and we need a ballast to our lives. This we can find only through satisfying our needs by village industries and decentralized production.

Large scale industries may be used as a necessary evil as has already been referred to above in the production of tools and machines needed for cottage and village industries and provision of basic raw materials such as sulphuric acid, steel etc can also provide natural monopolies such as, communications, means of transport, public utilities like water and power. Anything more than this will spell ruin and destruction to humanity. It calls for great care and forethought to be able to judge. However, we cannot resort to centralized methods of production in the satisfaction of our daily needs. Wherever there is a doubt, it is safer to fall back on the decentralized methods of production. Hence, we hold that the proper application of science and the way to real progress lies in resorting to village and cottage industries to satisfy our daily needs.

13-4-47

J. C. Kumarappa
(Harijan)

WANTED A THOUSAND NEW RURAL OCCUPATIONS

Economic development of our country can proceed only if both production and distributive justice are simultaneously enhanced. It is paradoxical that in spite of its abundant labour and unutilised resources, we continue to be poor. Gandhiji, after his experience in three continents- Asia, Europe and Africa- came to the conclusion that it is only through low capital, labour intensive, decentralised industries that we could produce a self-reliant and balanced interdependent society as would bring a co-operative and peaceful world into being. The experiments in village industries, which he initiated were meant not only to improve the existing crafts in the rural areas, but also to introduce new techniques on the basis of the latest scientific knowledge

which could improve our rural economy. To the scientist of India, he said on 13-2-27, "I would like you to be men, who stand up before the world firm in conviction. Let your zeal for the dumb millions be not stifled in the search for wealth. I tell you, you can devise a far greater wireless instrument which does not require external research but internal and all research will be useless if it is not allied to internal research which can link your hearts with those of the millions. Unless all the discoveries that you make have the welfare of the poor as the end in view, all your workshops will be really no better than Satan's workshop. Hence if a temper of science has to flower we will have to begin with strengthening the weakest link in the economic chain of the land."

With 80 percent of our people living in the villages, half of which are below subsistence, there could be no greater challenge than to work for removing the poverty that still prevails. That, this could not be achieved despite all the plannings of the last three decades is obvious. Whatever technological innovations trickle down the rural economic scene, invariably assist the upper stratum. Thus, though inputs of S & T have helped in the creation of more wealth, they have generated greater gaps between the rich and the poor.

Because of the constant inroads in rural employment made by capital-intensive, centralised urban industries, the basic pattern of rural India is very dark. At the turn of this century, the percentage of people in the villages which had occupations other than agriculture to support them supplement their income was 40%, by the middle of the century, it had come down to 10% and after another 25 years it has come down to only 2%. The result has been that whereas out of 365 days, at least 300 days of work should have been available to the villagers, the situation is that the work is available for less than 200 days in a year. This leaves a big gap of 100 days of worklessness in a society which is suffering from chronic poverty. Take the average population of over 550 thousand villages. It will come to round about 150 to 160 households per village and on the rough average, with 100 idle days in the year, each village loses, with about 300 adults

available for productive work, on the average 30000 man days. If you compute even at the rate of Rs. 6/- per man-day, this leads to a loss of about two lakh of rupees per village per year. Thus, the employment potential of rural India, if properly harnessed, will not only provide extra wages of round about 10 thousand crores per year, but through production generated, also add to the present GNP an extra Rs. 650 thousand crores. But, this will require finding modes of production and productive occupations for the rural sector through new techniques and trades which have to be evolved by the latest knowledge of science interacting with the conditions that exist where our toiling masses live.

The C. S. I. R. has been giving attention to such techniques as will assist rural development and had listed one hundred fifty or more of such evolved in its labs. However, when we analyse these techniques, we find that most of them are fit only for the bigger villages which are only one in fifteen. The situation of the poor demands that very simple devices be given to them to absorb their idle time. Even seasonal occupations should be found out because every technique that we evolve has to have a high degree of multipliability. A technique of processing eggs to make powdered dry food requiring half a million rupees and a large area to supply the raw material will have to be necessarily centralised and thus have a very low multipliability. The technique of making leaf cups used in food taking, which can be made better by

pressing the leaves at a slightly high temperature in a mould which will require no twines to be used for sewing; or a method of spraying a simple solution of bitumen or kerosene on mud walls, which will make the walls non-erodable against rain for 4-5 years are such techniques which could be multiplied by many lakhs. Thus the quotient of multipliability of a technique is a good criteria to judge its use as a remover of poverty.

To plan to provide work to millions of idle hands, let us find occupations, each of which may, on the average, give work to 2-3 people in each village. Thus, to employ 300 people 100 for days a year, each village will have to be provided with 100 new techniques. As all the villages cannot

have the same conditions, at least 10 sets of such 100 techniques i. e. 1000 techniques of low energy, low sophistication will have to be found out in the next ten years and their adaptation, acceptance and extension sought before the turn of the century. This could be the time-bound plan of the scientific community of the country.

Thus, 100 techniques for the poor in the villages every year should be the target. In the process of doing this, a thorough interaction will take place between the deep culture and talents of the land and modern scientific knowledge.

(Devendra Kumar)





Rural Technology—

THE "INEFFICIENCY" OF VILLAGE INDUSTRIES

The mill-owners have made the people believe that village industries cannot stand competition from large scale industries as the former are "inefficient" while the latter are scientific and efficient. By constant repetition, the public can be made to believe anything but this type of propaganda has been carried on to such an extent that even economists are saturated with such baseless ideas.

The advantages afforded to mill are many and one may almost assert that they are subsidised by public expenditures. The village artisan hardly ever derives any benefit from the crores of rupees taken from him and spent lavishly by the Government. The expensive researches of scientific institutions are not for him. The trunk roads built at fabulous cost are not only of no use to him,

but can even be injurious to his unshod bullocks—witness the mud tracks used in preference by bullock-carts by the side of macademised and asphalted roads. The armed forces are conspicuous by their absence in villages, though they are much in evidence in towns and cities, still these charges are met out of villagers production. The railway administration has no regard to the requirements of villagers, unless it be to drain their raw material at harvest season and to bring finished products back to them at enhanced prices. All these handicaps placed on village industries are counted towards their inability to compete with the upstart parasitic mills.

To those old time disadvantages the new fangled controls have added in no small measure. The All India Village Industries Association's agent for Bihar writes that the lifting of the ban on the interprovincial movement of oil-seeds and oils,

combined with the vagaries of the railways are telling upon the Ghani men. The railways bring in freely mill-pressed oils from the U. P. and the Punjab. This has pushed down the price of oils. But the scarcity in oil-seeds continues, as the railways refuse to allot any wagons for oil-seeds. The prices of these seeds are keeping to high levels while the price of mill oils has fallen considerably. Because of this differential treatment by railways, mustard seeds outside the province are selling at Rs. 21/- a maund while the same quality seeds are only available at Rs. 30/- a maund within the province. This is a transport-made scarcity and the Bihar Government pleads inability to set it right.

It is by such means that the natural vitality of village industries is being sapped and their succumbing to such methods is attributed to the "inefficiency" of village industries.

To obviate such discriminations, proper statistics should be maintained and all public expenditure benefiting the mills should be met out of levies made on the beneficiaries and not out of general taxation. Only by so doing can we establish equity between the various forms of production.

J. C. Kumarappa

Gram Udyog Patrika

(May, 1947)

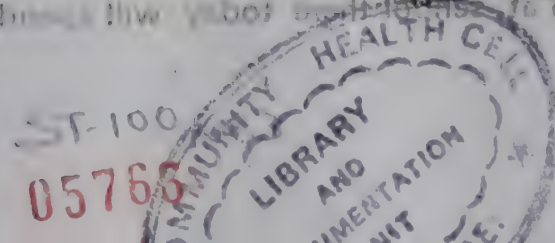


Infanticide

One of the methods of controlling over-population practised since time immemorial is infanticide. Centralized method of production, if it is not to commit suicide, has also to resort to controls. Price mechanism is a well-known practice. Cartels, combines and trusts also play such a role. But these have mostly been used to check production of supplies. To meet the requirements of war, production had to be given loose reins to build up reserves. Now that the need has passed, these reserves, if allowed to enter the market, will depress business. These goods, that formed the reserves, have already been paid for out of public funds. Hence to keep them from the market for consumption goods the surest and easiest course is to destroy them. Periodical destruction of over production is essential to centralized industries. To say that it is irrational is to confess that one does not understand the rudiments of centralized industries in consumption goods.

Therefore we read that aeroplanes and Rolls Royce engines are being destroyed at Bakshi-Ka-Talab aerodrome and that at Phaphamow, about two thousand bicycles were laid on the ground and steam rollers went over them. [Though this seems height of madness, yet we must accept this as being all in the day's work as long as we countenance the use of large scale centralized production units. The present economic order cannot function without such periodic destruction by wars while there is business depression and by steam rollers while there is over production. To appear surprised at such essential destruction can only be described as "naive". What is taking place is not "vandalism" but infanticide of large scale industries,

J. C. Kumarappa
Gram Udyog Patrika
(June 1946)



Large Scale Industries And Human Development

We have been constantly pointing out that work is a medium of education. It is through work that the man expresses himself and learns more about the environment and the science of what he is doing. When properly directed, work should be the main channel through which a human being develops to his full stature. It is from this principle that the Talimi Sangh is developing its technique of education through laycraft.

It follows from this, that if work is not given in a fully balanced form, development of the worker also will become eccentric or lopsided. Evidence of this can be looked for in the countries where large scale industries have replaced handicrafts. The best illustration of such a state of affairs is to be found in the United States of America. In a volume of Five Minute Biographies by Dale Carnegie, the following observation appears.

"There are more patients suffering from mental diseases in the hospitals of America than from all other diseases combined. One student out of every 16 at school there today will spend part

of his life in an insane asylum. If you are in 15 years of age, the chances are 1 out of 20 that you will be confined in an institution for the mentally ill for 7 years of your life. During the last decade, mental diseases have almost doubled. If this appalling rate of increase continues for another century, half the entire population will be in the insane asylum and the other half will be outside trying to support them by taxes."

The truth of the above statement has been constantly vouched for by references to the state of affairs in the health magazines etc. The only trouble is that the writers rarely seek for the causes.

We hope, therefore, that when India is to be reconstructed, our planners will keep in mind needs of the human body, mind and spirit apart from the material needs of the animal man. Unless our plan is comprehensive of these various aspects of human development, our planning will be not only futile, but derogatory to the progress of mankind.

J. C. Kumarappa

Gram Udyog Patrika

(Oct. 1947)

Our Mineral Policy

During this month, the Government of India is calling a conference to discuss the national mineral policy. It is well to remember that minerals are the treasure trove of a nation. They represent sources of employment to the people working in them. They also afford channels of international trade in proved surpluses.

Our mineral policy, therefore, will have to take into consideration these aspects. While we are not ready to work the minerals to the best advantage by our own effort, nothing is lost by letting them rest where they are. It will be held in trust for generations to come who, when they are ready, will be able to do justice to them. At this stage, when India is not yet able to feed and clothe herself, all our efforts should be concentrated on these primary needs. Afterwards, when we have more energy at our disposal, it would be necessary to investigate our mineral possibilities by scientific prospecting. It is not wise to merely dig up the ores and send them abroad. Such a course is equivalent to the action of a prodigal who sells his patrimony so as to live on it. If we are to use our resources carefully, we must transform these ores into finished products before we send them abroad. Until we are

able to do that it will be in the interest of the nation to leave them alone.

Mineral wealth of a country represents the possibilities of employment also. When we export raw materials like iron ore, bauxite, manganese ore, mica, magnesite, thorium, titanium etc. in the raw state, we are really sending out the chances of employing our own people in reducing these into various usable products. And to that extent we are doing a disservice to the generations yet unborn.

The commercial possibilities of trading in these ores for other articles must not tempt us into selling our birthright for a mess of pottage. It may be that some sources may be inexhaustible humanely speaking, but still as these represent the rights of our future generations, we have to deal with a full sense of responsibility. Our foreign trade, as far as possible, must be limited to finished products and should not include convertible raw materials.

We hope that this conference, which will consider the country's potentialities and policies which should govern the utilisation of mineral resources will give full weight to these considerations.

J. C. Kumarappa
Gram Udyog Patrika,
January 1947.

Public Cost of Centralized Production

As a remedy for all our ills, it is the fashion of the day to prescribe industrialization. Hardly any one stops to think if the remedy has ever succeeded in curing similar ill in any other case or if it has proved worse than the disease. A moment's careful thinking will show that the bulk of the evils the world today is suffering from is to be traced to industrialisation.

To run any centralised industry, great many facilities have to be guaranteed as the industry has to be sure of its raw materials, transport, labour and market. Each one of these needs a

a powerful organisation at prohibitive expense. Whether a particular industry be beneficial or not can only be seen after all factors that contribute to its working from raw material production to the effects of the finished goods on the consumers have been studied. If the farmers who supply the raw materials are starving, if the country wherefrom the raw materials are obtained is held in bondage, and if poverty and unemployment stalk the land, even though the manufacturers concerned may become multimillionaires, an industry which rests thus on the misery of millions will stand condemned.

J. C. Kumarappa

Drudgery

The unpleasant part of work is not necessarily drudgery. What makes for drudgery is the lack of interest in work. The same operations may be drudgery to one and a soul-absorbing work to another. To a paid gardner, his digging up the flower-beds or watering them may be drudgery but to the garden-lover, such work will provide the outlet for his sense of beauty. To the woman whose heart is in dance, tea and cocktail parties looking after her child will be drudgery, while to the lover of the home, it will provide the pivot round which her universe will revolve. Some claim that drudgery may be done away with by resorting to machine production. In fact, machines are the tools with which work is split up into its component parts making it impossible for the labourers to take an intelligent interest in their operations and hence such machines create

drudgery. A man detailed out to perform but one operation all tho 8 hours of the day has the quintessence of drudgery. In Jails, where the philosophy of work is pure and simple punished, even artistic work, such as carpet weaving, is reduced to drudgery.

Then, how can we dispense with drudgery ? Only by creating an interest in the work. A farmer, who has been educated to realise the social aspect of his contribution and is enabled to see in every furrow he makes, the formation of life-giving channels which will carry food and hope to starving fellowmen, will take pleasure and pride in the role he plays in society and obtaining satisfaction to his soul, will put his heart into his work. No tractor can do that. It is the only way to counteract drudgery.

J. C. Kumarappa



Decentralized Planning



Anna's Journal

DECENTRALIZATION-PRINCIPLE AND CRITERIA

There has often been talk of decentralization of industries, it seems necessary to examine this question in greater depth and evolve proper perspective. We have to determine the optimum scale of decentralization for a particular mode of production. The principle, which suggests itself, is that for human freedom to be vouchsafed, his requirement must be in such a way that his dependence for the supply of the same is not capable of being exploited. It means that the things which he requires most would be available to him as close to his environment as possible. According to the degree in the intensity of the requirement for a particular commodity, its supply should be closer to the consumer i. e. it should be decentralized most. The relativity inherent in the necessities will, therefore, govern the degree of decentralization for their fulfilment.

To understand this principle, the best example is our requirement of air. There is nothing more essential for human existence than air. Its availability therefore needs to be closest to him. Nature has provided air in such a way that one can get his need of air met in the immediacy of space and time i. e. whenever and wherever and in whatever quantity he wants, it is available to him. It is the most decentralized of commodities fulfilling human wants, and has priority number one. As we descend down the scale of priority, the degree of decentralization proportionately diminishes. Water is our second priority; so that it is considerably decentralized, but not to the same extent as air. Taking our clue from nature, we must plan our own methods of production as per the above principle.

We should see first as to the kind of want this is sought to be satisfied by a certain village industry and determine its place in the priority

scale of requirements of man. Its priority will automatically determine the degree of decentralization in its mode of production and supply.

Uptil now scale of production of a commodity has been determined on the basis of the technological, commercial and financial factors involved in its manufacture. If we value human freedom and do not want it to be subservient to machine, the opposite should, in fact be the approach. We have to so adjust the technological, financial and commercial dimensions of production as to be in line with the degree of decentralization by the essentiality for man.

Criteria

This degree of essentiality of a commodity can be tested by :

- i) The frequency of its replenishment (e. g. air we need every few seconds, water every few hours, food every day, clothes every few months, cycle every few years etc.). The greater the frequency the more the proximity of source of production.

- ii) The quantity in which it is required (the greater the quantity the more the proximity from which it should come, e. g. salt and spice which are used in small quantities can come from afar).

- iii) The proportion of people who require it (e.g. car, T. V. sets or some special medicine - these are required by few people and so need not be produced every where).

Thus, how many people need it, how many times and how much it is required- these factors will decide the degree of essentiality of an article. Once having determined this degree, the mode of supply of the article will have to be commensurate with the same. *The degree of decentralization will be in direct proportion (and its area of self-sufficiency in adverse proportion) to the state of essentiality of the particular commodity).*

Devendra Kumar

A VILLAGE-CENTRED PLAN

The advent of popular ministries at a time when the country is facing famine and shortages in primary consumption goods, may prove a blessing provided advantage is taken of the situation to launch a country-wide programme to increase the productivity of the people in selected sectors so as to make good the deficiencies. To be effective, such a programme has to be uniform and well-co-ordinated in all the provinces throughout the land. Patchwork schemes and isolated, desultory attempts will not carry us far. In order to facilitate consultation and discussion between the cabinets of the various provinces a conference of ministers was held at Poona on 31st July and 1st August, 1946.

This conference opened with an address by Gandhiji, who, in the course of his speech, pointed out that as the world is organized today, "the

mighty alone can survive to the exclusion at the cost of the weak. True independence demands there should be room even for the weakest. The base and foundation of economic activity is agriculture. Years ago, I read a poem in which the peasant is described as the father of the world. If God is the provider, the cultivator is his hand. What are we going to do to discharge the debt we owe him? We have lived so long only by the sweat of his brow."

There are people who say that no basic reform in agriculture is possible without political power. They dream in terms of industrialization of agriculture by large-scale application of steam or electricity. I warn them that trading on soil fertility for the sake of quick returns will prove to be a disastrous, short-sighted policy. It will result in virtual depletion of the soil. God's earth called for the sweat of one's brow to yield the bread of life.

People may criticize this approach as being slow and unprogressive. It does not hold out promise of dramatic results. Nevertheless, it holds the key to the prosperity of both the soil and the inhabitants living on it. Healthy, nourishing food is the alpha and the omega of rural economy. The bulk of a peasant's family budget goes to feed his family. All other things come afterwards. Let the tiller of the soil be well-fed. Let him have a sufficiency in fresh, pure milk, ghee and oil, and fish, eggs and meat if he is non-vegetarian. What would fine clothes, for instance, avail him if he is ill-nourished and underfed? The question of drinking-water supply and other things would come next.

As consideration of these questions would naturally involve such issues as the place of plough-cattle in the economy of agriculture as against the tractor-plough and power-irrigation, etc. and thus, bit by bit, the whole picture of rural economy would emerge before them. In this picture, cities would take their natural place and not appear as unnatural, congested spots or boils on the body politics as they are at present. We stand today in danger of forgetting the use of our hands, to forget ourselves. To think that your occupation of the ministerial chair will be vindicated if you serve the cities only, would be to forget that India really resides in her 7,00,000 villages. What would it profit a man if he gained the whole world but lost his soul in the bargain?

If you feel in your hearts that you have taken office as custodians and representatives of

the interest of masses. Everything that you do your legislation, your executive orders, the instructions that you issue, will breathe concern for the villager. To protect his interests, you do not need the Viceroy's section. Supposing you want to protect the hand-spinner and the hand-weaver against the competition of textile mills and solve the problem of cloth shortage for the masses, you will put aside red tape and send for the mill-owners and tell them that unless they want you to go out of office, they must make their production policy conform to the requirement of the masses whose custodian and representative you are. You will tell them not to send mill cloth to certain areas which are put under hand production and not to produce a certain range of textiles which comes within the hand-loom weavers' domain. If you are in earnest, your word will go home and they will willingly give their co-operation as they did recently when they provided the required textiles for export to Indonesia in return for Indonesian surplus rice for the relief of the Indian famine. But there must be that inner conviction first; everything else will then be all right.

The Resolution : The Memorandum on Governmental Functions submitted by the All-India Village Industries Association was then discussed and the following resolution was passed:

"Having considered the policy that should govern the economic development to be initiated by popular ministeries, this Conference of ministers assembled from various provinces at Poona, hereby resolves :

That in view of the acute scarcity prevailing in the country with respect to the primary requirements of the people, especially food and clothing, plans for economic development should centre round the farmer and agriculture, and should be motivated with the object of providing a balanced diet, adequate clothing and other articles of primary human need for every citizen in the land; and that for this purpose, steps be taken to ensure that the land available for cultivation is distributed by proper regulation such as licensing, between various crops needed by the community and in the required proportion;

That, in order to achieve real democracy, it is necessary to organize contiguous areas-village or a group of villages-on a self-sufficient and self-governing basis, through multi-purpose co-operative societies and grain banks which will plan their economic life on a decentralized basis, reducing the need for

money economy to a minimum and restricting external trade to proved surpluses."

Now that the Central Government also will function under the direction of our national leaders, may we hope that this resolve to plan for the economic development, starting with an attempt to strengthen the body with a balanced diet and to provide all the primary needs of the people, will materialize in no distant future?

This approach to planning is both simple and inexpensive. Being broad-based, it is calculated to bring relief to the masses in the shortest possible time. This can be the surest method of combating black-marketeering, inflation and the ration muddle. The conditions in the country brook no delay. We trust the popular ministries will take immediate steps to implement their resolution and thus fulfil the promises made to their electorates.

J. C. Kumarappa

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As time passes J. C. Kumarappa, the exponent of economics of decentralization and renewable resources, whom Gandhi chose as his lieutenant for rural industry movement was an original thinker and visionary. Herein are his articles on topics of burning interest, interspersed with those of his disciple Devendra Kumar, the Director of Centre of Science for Villages, Wardha. The two are complimentary and make a holistic approach towards Science & Technology which really will make the readers pause and think.

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